

Electrical Safety Management System of Renewable Energy

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➤ Energy Consumption Status of S. Korea ('16)

Division	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th
Energy Consumption	China	U.S.	India	Russia	Japan	German	Brazil	Korea	Canada	Iran
Million TOE	2,973	2,167	862	732	426	310	285	282	280	248
Oil Consumption	U.S.	China	India	Japan	Saudi	Brazil	Korea	German	Canada	Mexico
Million ton	865	574	217	184	167	140	123	112	102	86
Power Consumption	China	U.S.	India	Japan	Russia	German	Korea	Canada	Brazil	France
TWh	5,946	4,148	1,216	1,012	969	573	544	538	520	478

Source : Energy Balances of OECD/Non-OECD Countries 2018(IEA), Statistical Review of World Energy 2018(BP)

Need to strengthen safety management of renewable energy

- Background of ‘Renewable Energy 3020’ Plan
 - Korea imports 94.2% of required energy from overseas.
 - Petroleum, which accounts for 71% of total energy imports, is supplied by 85.9% in the Middle East.
 - Having a supply-demand structure that is relatively vulnerable to energy security because energy imports are absolutely high.
 - Policy changes due to greenhouse gas reduction and energy conservation.

Need to strengthen safety management of renewable energy

- ‘Renewable Energy 3020’ Plan
 - Increase the proportion of renewable energy generation to 20% of total generation by 2030.
 - Supply more than 95% of new generation facilities with clean energy such as solar and wind power
 - Promoting the achievement of goals through public participation type development projects and large-scale projects.

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- To achieve ‘Renewable Energy 3020’ Plan
 - Need for intensive development of clean energy industry.
 - Need to find and spread the energy industry based on the fourth industrial revolution such as distributed generation.

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- Need for security of electrical fire hazards arising from the enlargement and advancement of renewable energy facilities.
- Increase in demand of related facilities safety management & Establish standards of inspection and technology.

➤ Permit for Construction Plan

- Prevention of accidents through technical review and approval of construction plans.

Division	Permit	Inform
Criteria	10,000 kW or more,	Less than 10,000 kW,
Subject	Government	KESCO or Head of Local Government
Object	Solar Power, Wind Power, Fuel cell equipment, Electric storage equipment	Solar Power, Wind Power, Fuel cell equipment, Electric storage equipment

- Pre-use Inspection
 - Inspect whether the installed renewable energy facility meets the declared construction plans and technical standards before use

- Periodic Inspection
 - Perform periodic (within 4 years) inspections based on electrical equipment technical standards and judgment criteria to verify that the maintenance status of electrical equipment is appropriate.

➤ Pre-use Inspection

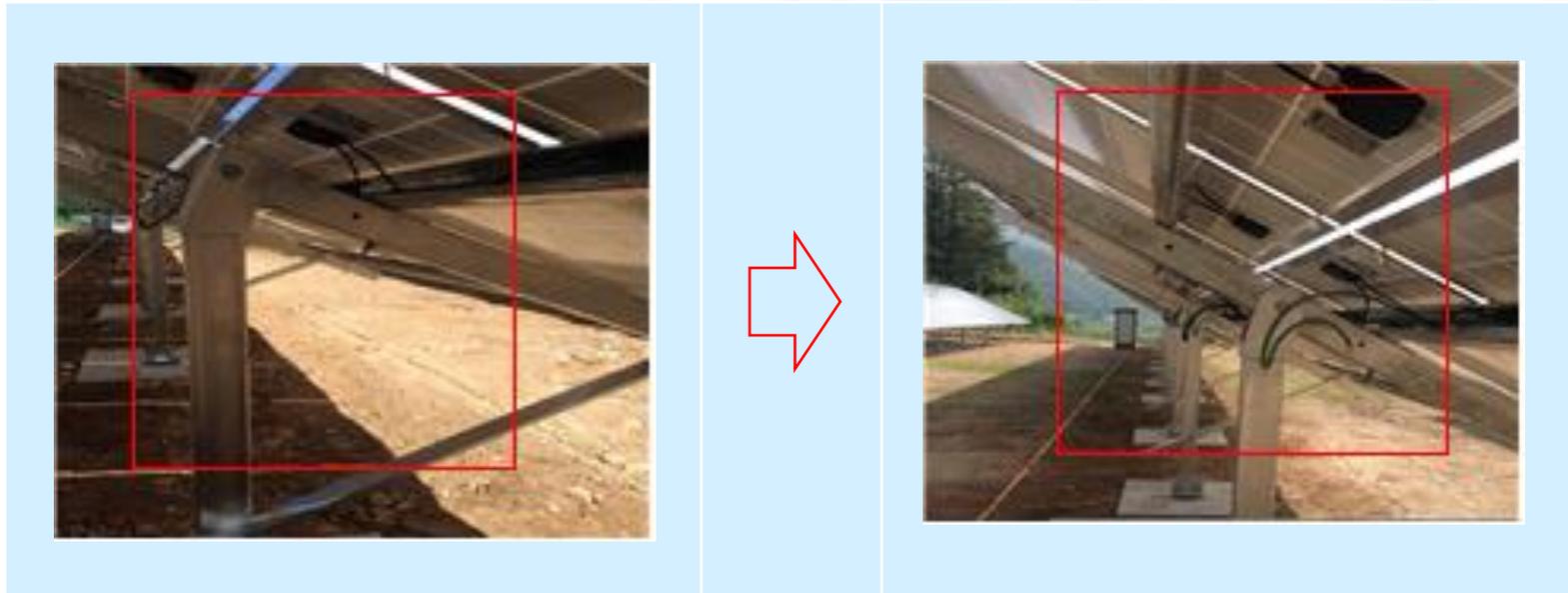
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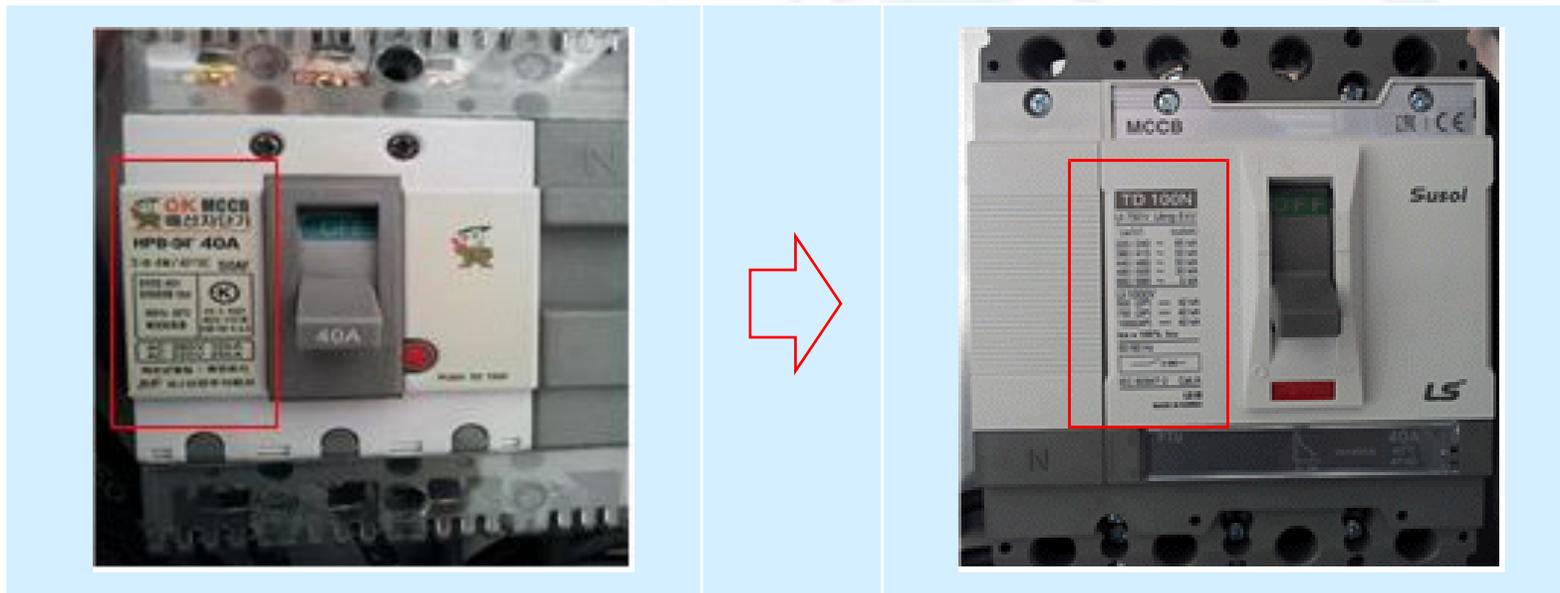
Electricity safety inspection of renewable energy installations is proceeding in the same way as the existing method

- No electrical connection of solar modules and module supports.



Judgement Standard Article 54: The frame of the photovoltaic module should be completely electrically connected with the support.

- AC circuit breaker installed in DC circuit



Judgement Standard Article 38 and 290: Overcurrent circuit breaker installation in low voltage electrical circuit.

- Low voltage service line height of 2.0m is not suitable.



Judgement Standard Article 100: The height of the low voltage service line should be over 2.5m above from the top of the ground

- Separation distance between upper part of PV module and extra high-voltage line Not suitable



Judgement Standard Article 135: Observe the separation distance between the extra high-voltage line and the upper part of the structure.

- Improve Statute
 - Establish a legal basis for enhancing the safety of renewable energy electrical installations.

- Complement technical standards
 - Analyzing the causes of various problems in installing and operating the renewable energy electrical installations, and improving related technical standards based on them.

- Strengthen government policy
 - Establishment of safety standards and inspection systems at the government level.

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